

## ABSTRACT OF THE DISCLOSURE

The present invention relates to an apparatus and method for a measurement of a film thickness using an improved fast Fourier transformation. The apparatus includes a light source, a light receiving unit for converging a light from the light source, a detection unit for splitting a reflection light reflected by the surface of the sample and inputted into the optical fabric through the lens, and outputted to the other side of the optical fabric based on a light intensity of each wavelength and providing a certain amount of wavelength, a conversion unit for converting a wavelength based spectrum data detected by the detection unit into an analog signal and then converting into a digital signal through a converter, a computation unit for computing the number of vibrations based on a high speed Fourier transformation, and an analyzing unit for measuring a film thickness.